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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/517,345	12/09/2004	Isao Gunji	262819US3PCT	5575
22850 7590 06/13/2007 OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314				
			EXAMINER CHANDRA, SATISH	
			ART UNIT 1763	PAPER NUMBER
			NOTIFICATION DATE 06/13/2007	DELIVERY MODE ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdocket@oblon.com
oblonpat@oblon.com
jgardner@oblon.com

Office Action Summary	Application No. 10/517,345	Applicant(s) GUNJI ET AL.	
	Examiner Satish Chandra	Art Unit 1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 May 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 - 7, 10 and 11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 - 7, 10 and 11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 December 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>1/05</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1 – 5 and 10 are rejected under 35 U.S.C. 102(e) as being anticipated by Funaki et al (US 2003/0205202).

Regarding claims 1 and 10, Funaki et al discloses a plasma CVD device comprising:

A chamber 200 (Fig 1, Para 0056 - 0058) defining a process area,

A lower electrode (mounting table) 220 disposed in the chamber 200 for mounting the object W on it to be processed,

A gas supply unit (Para 0061) for supplying a gas into the chamber 200 comprising a shower head 211 (gas dispersion unit, Fig 1) having a plurality of gas dispersion holes 214 (Para 0058) for the dispersion of gas,

A lower electrode (mounting table) 220 disposed substantially parallel to the gas dispersion plate 211 (surface) of the chamber,

In a substantially vertical cross section of the chamber 200 taken along a flow of the gas from the gas supply port 214 toward the object W to be processed, an upper

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electrode (side wall) 210) of the chamber 200 defining the processing area and abutting on the gas dispersion plate (surface) 211 and forms an angle greater than 90 degrees with the surface of the chamber close to the mounting table,

The side surface of the lower electrode (mounting table) 220 on which wafer (object) to be processed is configured to match the slant of the sidewall.

Regarding claim 2, the gas dispersion plate is configured to have a substantially same area as that of the wafer (object) W.

Regarding claim 3, lower electrode (mounting table) 220 on which wafer (object) to be processed is mounted forms an angle greater than 90 degrees (Fig 1) with a side surface of the mounting table abutting on the mounting surface.

Regarding claim 4, the lateral surface 222 of the lower electrode (mounting table) 220 is fashioned in such a manner as to be parallel with the side-wall 2a of the chamber (Para 0063, Fig 1).

Regarding claim 5, distance between the sidewall of the chamber 400 (Fig 7) and the side surface of the mounting table (lower electrode) is less than the distance between the surface (gas distribution plate) of the chamber 400 and object W to be processed.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 6 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim et al (US 2003/0070617) in view of Cook et al (US 2003/0049372) and Funaki et al (US 2003/0205202).

Kim et al discloses:

A processing chamber 4 (Fig 1) defining a processing area,

A mounting table 3, disposed in the chamber 4 for mounting thereon wafers 2 to be processed, a gas supply port (not labeled) for supplying a gas into the chamber 4

A sidewall of the chamber (not labeled) defining the process area and abutting on the surface (not labeled) of the chamber forms an angle greater than 90 degrees with the surface of the chamber and extends close to the mounting table 3.

Kim et al does not disclose:

Mounting table 3 disposed substantially parallel to the flow direction of the gas supplied.

The mounting table having a mounting surface for mounting thereon the object to be processed and a side surface forming an angle greater than 90 degrees with the mounting surface,

Cooke et al discloses a single wafer reactor (Fig 3) in which the gas is supplied parallel to the upper surface of the mounting table.

Funaki et al discloses a lower electrode 220 (Fig 1) wherein the side surface forms an angle greater than 90 degrees with the mounting surface,

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a mounting table parallel to the flow of the horizontal gas in the apparatus of Kim et al as taught by Cook et al; providing a mounting table wherein the side surface forms an angle greater than 90 degrees with the mounting surface in the apparatus of Kim et al and Cook et al as taught by Funaki et al.

The motivation for providing a horizontal gas flow in the apparatus of Kim et al is to provide an alternate and equivalent mounting table (susceptor) arrangement.

The motivation for providing a mounting table wherein the side surface forms an angle greater than 90 degrees with the mounting surface in the apparatus of Kim et al and Cook et al as taught by Funaki et al is to provide an alternate and equivalent mounting table.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Funaki et al (US 2003/0205202) in view of Carpenter et al (US 2004/0089233).

Regarding claim 7, Funaki et al discloses a plasma CVD device comprising:

A chamber 200 (Fig 1, Para 0056 - 0058) defining a process area,

A lower electrode (mounting table) 220 disposed in the chamber 200 for mounting the object W on it to be processed,

A gas supply unit (Para 0061) for supplying a gas into the chamber 200 comprising a shower head 211 (gas dispersion unit, Fig 1) having a plurality of gas dispersion holes 214 (Para 0058) for the dispersion of gas,

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A gas exhaust port 203 for evacuating the chamber 200 wherein on of the sidewalls 2a of the chamber 200 defining the processing area and abutting on one surface (gas distributing plate (not labeled) containing gas distribution holes 214 of the chamber forms an angle greater than 90 degrees and extends close to at least a portion of an outer surface of the object W to be processed.

Funaki et al does not disclose:

The gas flows a passageway whose cross sectional area is gradually decreased from a distal end of the object to be processed to the gas exhaust port.

Carpenter et al discloses:

An apparatus 12 (Fig 1) wherein the gas flows 16 a passageway whose cross sectional area is gradually decreased from a distal end 26 of the object to be processed to the gas exhaust port 42.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a gas flow passageway whose cross sectional area is gradually decreased from a distal end of the object to be processed to the gas exhaust port in the apparatus of Funaki et al as taught by Carpenter et al.

The motivation for providing a gas flow passageway whose cross sectional area is gradually increased from the gas supply port to a proximal end of the object to be processed and is gradually decreased from a distal end of the object to be processed to the gas exhaust port is to provide a greater amount of gas above the surface of the object to be treated.

Response to Arguments

Applicant's arguments with respect to claims 1 – 7, 10 and 11 have been considered but are moot in view of the new ground(s) of rejection.

However, regarding the rejections of Claims 1-5 and 10 under 35 U.S.C. § 102(e) as anticipated by Funaki and of Claim 7 under 35 U.S.C. § 103(a) as unpatentable over Funaki in view of Carpenter are traversed.

The present invention, as recited in independent Claims 1, 7, and 10, relates to a processing device. The processing device includes a chamber defining a processing area; a mounting table, disposed in the chamber, for mounting thereon an object to be processed; a gas supply port for supplying a gas into the chamber, the gas supply port being provided at a surface of the chamber; and a shower head fitted in the gas supply port and having a plurality of gas supply openings at an its surface exposed to an inside of the chamber. Each of Claims 1, 7, and 10 further recite that the plurality of gas supply openings are provided substantially throughout the exposed surface of the shower head. By employing the claimed configuration, the stagnation of gas can be prevented at an area near the gas supply port, and the gas can be supplied to the entire surface of the object to be processed. As discussed in Applicants' specification, since the stagnation of gas is decreased, the change of the atmosphere in the chamber becomes easy, so that the gas change is performed at a high speed.³

Turning to the applied references, Funaki describes a plasma CVD device. As illustrated in Figure 1, the plasma CVD device includes a vacuum container (200) that includes a gas dispersion plate (213) that is formed a plurality of gas dispersion holes (214).⁴ The discharge surface on the edge of the gas dispersion plate (213) is fashioned in such a manner that it becomes progressively broader as it proceeds downwards.⁵ This discharge surface is divided into two in the shape of a ring around the centre axis of the gas dispersion plate (213).⁶ The inner discharge surface (1a) is fashioned horizontally, while the outer discharge surface (2a) is fashioned in such a manner as to form an angle in excess of 90 degrees to the inner discharge surface (1a).⁷ However, Funaki fails to describe or suggest a plurality of gas supply openings that are provided substantially throughout the exposed surface of a shower head.

As illustrated in Figure 1, Funaki describes that a ring-shaped insulator (300) formed of alumina or a similar substance is attached to the horizontal section (1a) of the discharge surface on the edge of the gas dispersion plate (213).⁸ Funaki states that "insulation of the horizontal section 1a of the discharge surface on the edge of the gas dispersion plate 213 is implemented with the aid of an insulator 300 makes it possible to enhance the effect of inhibiting discharge in

However, as can be seen in Figure 1, attaching the ring-shaped insulator (300) to the horizontal section of the discharge surface (1a) limits a surface for forming gas dispersion holes (214) to a middle portion of the horizontal section of the discharge surface (1a). Limiting gas dispersion holes (214) to a middle portion of the horizontal section of the discharge surface (1a) is not a plurality of gas supply openings that are provided substantially throughout the exposed surface of the shower head.

The Examiner disagrees because of the following reason: As can be seen in Fig 1, the plate 300 covers the edge portion of the showerhead and thus the edge of the showerhead is not exposed. The middle portion of the showerhead is the only exposed surface of the showerhead. Holes are provided substantially throughout the exposed surface of the showerhead as can be seen in Fig 1.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

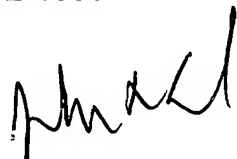
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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Satish Chandra whose telephone number is 571-272-3769. The examiner can normally be reached on 8 a.m. - 4:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, Primary Examiner, Jeffrie R. Lund can be reached on 571-272-1437. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


Satish Chandra


Jeffrie R. Lund
Primary Examiner

SC
5/24/2007